

Evaluation of acute stroke patients applying to a university emergency service in terms of risk factors

Evaluation of acute stroke patients

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Abstract

Aim: Stroke is a group of diseases that causes morbidity and loss of function at the highest rate worldwide that mostly affects the quality of life and is the second leading cause of death after heart diseases. In the present study, we aimed to determine the risk factors of the patients who applied to the emergency service and their distributions. **Material and Method:** Our study was formed retrospectively by evaluating the follow-up files of 194 patients who applied to Dicle University Medical Faculty Emergency and Traumatology Polyclinic and were diagnosed with stroke and were followed between June 1, 2014 and June 1, 2016. **Results:** Of the 194 patients included in the study, 98 (51%) were female and 96 (49%) were male, the mean age was 69.6 ± 13.4 . One hundred and seventeen of patients (60%) were diagnosed with ischemic stroke, 77 of them (40%) were diagnosed with a hemorrhagic stroke. The mean age of men and women were 69.9 ± 10 and 69.3 ± 15.7 years respectively. According to the types of stroke, the mean age for those with ischemic stroke was 69.9 ± 12.6 , for those with hemorrhagic stroke was 69.3 ± 14.8 . In both types of stroke, the values of systolic and diastolic blood pressure were higher than normal. When the age of the patients was compared in terms of both sex and type of stroke, no significant difference was determined in terms of age in the groups. The incidence of stroke was greater between the ages of 45 and 84 in 164 patients (84.5%). **Discussion:** The average age of the patients was in the advanced group and their average tension values were higher than normal. For this reason, advanced age and high blood pressure were considered as risk factors contributing to stroke development in our study group. It is significant to evaluate the risk factors of the patients during the continuous health services given to the patients and to provide appropriate treatment and regular follow-ups for those with risk factors.

Keywords

Ischemic Stroke; Hemorrhagic Stroke; Chronic Diseases; Risk Factors

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Introduction

Stroke is a group of diseases that causes morbidity and loss of function at the highest rate worldwide that mostly affects the quality of life and is the second leading cause of death after heart diseases. It is the most common cause of epilepsy, the second most common cause of dementia and also one of the most common causes of depression [1,2,3]. In the world, 17 million people suffer from stroke, 6 million people die of stroke, in every 40 seconds a stroke occurs and in every 4 minutes, a death occurs [4].

The mortality rate for patients with stroke is 10-20 % in the first following month. On the other hand, 30 % of all patients die in one year. Of the patients who suffer from stroke and survive, only 10 % do not develop any sequel, 30 % show low disability, 50 % show severe disability and 10 % need continuous institutional care. The survival rate of the patients after stroke in ten years is 35 %. Due to the high mortality and morbidity rate, stroke is not only a significant health problem but also a big social and economic problem. In the UK, almost half of the health expenses are used for stroke treatment and following social care [5].

While productivity loss created by patient care, labor loss, disability, and death cases is 2 billion dollars, daily treatment in the unit of stroke costs 900 dollars, thrombolytic treatment for once costs 750 dollars and patient care at home for a week costs 8000 dollars. The average cost is approximately 36.000 dollars. After a stroke, only 7 % of the patients live more than 10 years and it is thought that real cost is much higher off the books [6,7].

In the USA, 795.000 stroke cases occur in a year and of those cases, 610.000 are the first stroke experiences whereas 185.000 are the recurrent ones. The total cost for the treatment and rehabilitation of those patients is approximately 73,7 billion dollars. Only 10 % of the patients can go on their lives without any disabilities [8,9].

Similar to the other diseases, we confront the fact that knowing especially the preventable risk factors for stroke and developing solutions are strategies which are both problem-effective and cost-effective.

Within this study, it was aimed to determine the distributions of the stroke types considering the patients with stroke who applied to the emergency service according to their sociodemographic features, clinical, and laboratory parameters.

Material and Methods

Within the study, the follow-up files of patients who applied to Dicle University Medical Faculty Emergency Service between June 1, 2014 and June 1, 2016 and were diagnosed with stroke were evaluated retrospectively. Within this evaluation, the stroke types, sociodemographic features, laboratory parameters, and anamnesis data of the patients were reached and they were registered into the data gathering forms. Having applied to the emergency service with the diagnose of acute stroke, the patients whose ages were above 18 were involved in the study. The ethics committee approval for the study was taken from Dicle University Non-invasive Investigation Ethics Committee with the date of 02.06.2016 and the number of 218.

Statistical Analysis

The evaluation of the data was made with IBM SPSS Statistics for Windows, version 18 (IBM Corp., Armonk, N.Y., USA) programme. Basic statistical evaluations were made as descriptive

statistics, average, standard deviation, and frequency tables. Continuous variables were expressed as average ± standard deviation while categorical data were expressed frequency and percentage. The conformity of the data to the normal distribution was evaluated with the Kolmogorov-Smirnov test. The evaluation for the qualitative variables was made with the Chi-square (x2). The Student-t and Mann-Whitney U tests were used in order to evaluate continuous variables and the value of p<0,05 was found significant.

Results

Among the files of evaluated 194 patients, 98 (51%) were female and 96 (49%) were male. The mean age of the whole patients was 69.6±13.4. The mean age for male patients was 69,9±10,7 while it was 69,3±15,7 for female patients. A significant difference could not be found between the stroke types and age average for both women and men (Table 1).

According to the types of stroke, the mean age for those with ischemic stroke was 69.9±12.6 and for those with hemorrhagic stroke was 69.3± 14.8. No significant difference was found between age groups after categorizing the patients according to their ages (Table 2). The most common complaints among the patients were impairment of consciousness and speech disorder. The complaints of the patients were summed up (Table 3). For the patients with hemorrhagic stroke, 72 patients had intraparenchymal bleeding and 5 patients had subarachnoidal bleeding. Of the applying patients, 117 (60,3 %) patients were discharged from the hospital whereas 77 (39,7 %) patients ended up with exitus. Of the patients who lost their lives, 52 % had an ischemic stroke and 48 % had a hemorrhagic stroke.

Comparing the patients with ischemic and hemorrhagic strokes in terms of mortality, the mortality rates were found similar in both stroke types (Table 4).

Table 1. Age Distribution of Stroke Types According to the Gender

	Stroke Type	Ort. ± SS	Min.	Max.	p
Female	ischemic stroke	69,4± 15,1	23,0	106,0	0,969
	hemorrhagic stroke	69,3 ± 16,7	26,0	94,0	
Male	ischemic stroke	70,3 ± 9,9	51,0	91,0	0,700
	hemorrhagic stroke	69,4 ± 12,3	38,0	89,0	
Total	ischemic stroke	69,9 ± 12,6	23,00	106,0	0,786
	hemorrhagic stroke	69,3 ± 14,8	26,0	94,0	

Table 2. Distribution of Stroke Type According to the Groups

Age Groups	Ischemic Stroke	Hemorrhagic Stroke	Stroke Types		Total	p
<45	N		4	6	10	0,154
			40,0%	60,0%	100,0%	
	45-84	N	105	59	164	
			64,0%	36,0%	100,0%	
85+	N		9	11	20	
			45,0%	55,0%	100,0%	
Total %	N		118	76	194	
			60,8%	39,2%	100,0%	

When vital findings and laboratory values of the patients with ischemic and hemorrhagic were compared at the time of applying, there could not be found a significant difference between groups (Table 5).

Table 3. Distribution of Complaints of Emergency Application with Stroke Patients

Application Complaints For Emergency Service	N	%
Sudden Consciousness	112	57,7
Speech Disorder	59	30
Loss of consciousness	5	2,5
Vomiting	13	6,7
Loss of Force Right Limb	74	38
Loss of Force Left Limb	50	25,7
Headache	13	6,7
Total	194	100

Table 4. Distribution of Mortality Rate According to Stroke Type

Ischemic stroke Hemorrhagic stroke	Stroke Type			Total	p
	Discharged	Finalization	Exitus		
	N	71	46	117	0,960
	%	60,2%	60,5%		
	N	47	30	77	
	%	39,8%	39,5%		
Total %	N	118	76	194	
	100%	100%			

Table 5. Relationship Between Clinical Parameters and Stroke Type

	Stroke Types			p
	İschemic stroke	Hemorajik İnme	Toplam	
	Ort. ± SS	Ort. ± SS	Ort. ± SS	
Pulse	91,6 ± 24,3	104,4 ± 93,5	96,6 ± 61,6	0,786
Systolic	165,8 ± 38,1	159,2 ± 36,3	163,2 ± 37,4	0,157
Diastolic	92,3 ± 18,9	91,2 ± 23,5	91,9 ± 20,8	0,235
Glucose	156,3 ± 76,1	149,2 ± 61,4	153,5 ± 70,7	0,721
HDL	39,8 ± 11,9	39,9 ± 16,6	39,9 ± 13,9	0,554
LDL	116,2 ± 46,9	120,4 ± 40	117,8 ± 44,2	0,954
Triglycerides	119,3 ± 69,3	131,1 ± 65,8	124 ± 68	0,52
Total Cholesterol	174,8 ± 54	183,2 ± 55,2	178,1 ± 54,5	0,24
CRP	2,1 ± 2,8	2,0 ± 2,7	2,1 ± 2,7	0,773
Hospitalization Time	36,3 ± 49,7	42,8 ± 87,7	38,8 ± 67	0,512
GKS	11,6 ± 3,4	11,8 ± 3,6	11,7 ± 3,5	0,773

Discussion

Stroke is one of the most important causes of mortality and morbidity resulting from some risk factors such as hypertension (HT) and hyperlipidemia which get more common with aging [10]. Stroke is a disease which gets more and more common each passing day in our country and in the world. Since it can end up with high morbidity and mortality, it is getting more and more important. Treatable risk factors such as hypertension and hyperlipidemia should be determined in order to minimize

Table 6. Average Points of Glaskow coma scale- Distribution of Mortality Rate

GKS Average	Ort. ± SS	N (%)	P
	Discharged	13,3 ± 2,5	117 (60,3)
Exitus	9,2 ± 3,4	77 (39,7)	
Total	11,7 ± 3,5	194 (100)	

GKS: Glaskow coma scale

mortality and morbidity based on stroke and prevent the recurrence.

The risk of stroke increases comparatively with age and this risk gets double in each decade after the age of 55 [10,11]. Strokes that occur below the age of 45 are in the rate of 4-10 % [12]. Of the studies made with different age groups which suffer from stroke, the rate was found higher between the ages of 60-70 [13,14]. In the study by Kıyan et al. [15], the incidence of stroke below the age of 45 was found 5 % and it was found 6,1 % in the study by Şahin et al. [16]. In our study, compatible with the literature, the rate of stroke increases with age.

In the literature researches, it has been revealed that gender is one of the important factors in the etiology of stroke and the rate of male patients is more than the rate of female patients [17,18]. In many studies made in our country, for all of the age groups, it has been found that acute stroke is seen more common inmen [14,15,19-22]. Accompanying and cardiovascular diseases in men might cause early deaths. In the researches related to stroke etiopathogenesis, most commonly known risk factors are considered hypertension, diabetics and high cholesterol [21,23,24]. There are reliable proofs that HT and DM are serious risk factors especially for the patients who cannot be controlled with medical treatment [23,25]. High blood pressure and increased risk in stroke are directly proportional. It is stated in the studies that HT is available at the rate of 75 % with ischemic strokes where it is available in the rate of 72-81 % with hemorrhagic strokes [26,27]. In many studies made in our country, those risk factors have also been determined as the most common ones [15,21,23]. Similar results were found in the studies made in the Middle East and Asian countries [28-30]. There are also studies showing that the patients already have hypertensive findings at the time of applying to the emergency service among the researches related to tension values of the patients with stroke [14,15,23]. In the study by Efstathiou et al. [25], it was found that the mean of systolic blood pressure (SBP) in the patients with ischemic stroke was 161,7±21,5 mmHg and 165,4±15,3 mmHg for the patients with hemorrhagic stroke. Whereas the mean of diastolic blood pressure (DBP) was 96,5±11,5 mmHg in the patients with ischemic stroke, it was found as 100,5±8,6 mmHg in the patients with hemorrhagic stroke. In our study, incompatible with the literature, while the mean of SBP in the group with ischemic stroke was found 165,8±38,1 and 159,2±36,3 in the group with hemorrhagic stroke, the mean of DBP was detected 92,3±18,9 in the group with ischemic stroke and 91,2±23,5 in the group with hemorrhagic stroke. High blood pressure confronts us as a physical examination finding and a valid risk factor for all types of strokes in the physical examination. In our study, the most explicit risk factor was that the patients were hypertensive. The

fact that our patients receiving treatment for hypertension disrupted their medications and could not fully implement their lifestyle recommendations could have been effective in these results. Regular follow-up in terms of hypertension and end organ damage cannot be done regularly in terms of the presence of hypertension infrastructures in stroke patients, may be an etiological factor.

It was found in the study by Soyama et al. [31], development of stroke based on aging got four times more in the ones with HDL<30 mg/dL than in the ones with HDL≥60 mg/dL. In the study by Ralph et al. [32], of 539 patients with ischemic stroke, the mean of total cholesterol was 193 mg/dL, LDL median was 121 mg/dL, HDL mean was 40 mg/dL and the median of triglyceride was 136 mg/dL. It was found that the increase in the level of HDL decreased the risk of ischemic stroke in a study with different ethnic groups and old patients. In the study by Şahin et al. [16], HDL median of the patients with ischemic stroke was found lower than the one in the patients with hemorrhagic stroke. In 86,8 % of the patients whose HDL level was below 45 mg/dl and in 68,2 % of the patients whose HDL level was 65 and above had an ischemic stroke and the inverse relation between HDL level and ischemic stroke was found statistically significant. In our study, the mean HDL value of all patients was 39,9±13,9 and comparing the stroke types it was found 39,8±11,9 in the ones with ischemic stroke and 39,9±16,6 in those with hemorrhagic stroke. Unlike the study conducted by Şahin et al. in our study, there was no significant difference in terms of HDL levels between the hemorrhagic and ischemic stroke groups.

In the literature, although hemorrhagic stroke is seen less than ischemic stroke, the death rate is higher in hemorrhagic strokes than the ischemic ones and death occurs in the early period in the hemorrhagic strokes [33]. Mortality rate based on stroke was found 17 % in the study by Yılmaz et al. [34]. In 40 % of the hemorrhagic strokes and in 13 % of the ischemic strokes there was a fatal course. Statistically, significant difference was found between stroke type and matter of death-life in the study by Şahin et al. Whereas mortality was 34,1 % in hemorrhagic stroke, it was 13,3 % in ischemic stroke [16]. It was stated that the death rate was higher in the case of hemorrhagic strokes in the study by Alp et al. [35]. It was observed that 24 % of the patients died at the time of their hospitalization and 26 % of the patients died in the first three months after the stroke in the study by Nakayama et al. [36]. In our study, incompatible with the literature, death rate in hemorrhagic strokes (48 %) was detected higher than the rate in ischemic strokes (34 %). The death rate in the patients with stroke ranges from 12,7 % to 33 % [17,37,38]. In our study, the death rate was found higher (39,7%). The reasons of this result may be that the rate of the patients with hemorrhagic stroke was higher, the patients were in advanced age, the hospitalization duration was long, the addition of hospital infections to the table and the effect of previous diseases.

In the study by Şahin et al. [16], the hospitalization duration of the patients with hemorrhagic stroke was 11,0 ±10,0 days and 8,0 ±9,0 days for the patients with ischemic stroke. On the other hand, in the study by Yılmaz et al. [34], the hospitalization duration was found 7,6±6,5 days on average. In the study by Nakayama et al. [36], it was found that as the ages of the patients increased the hospitalization duration got longer. In our study, the hospitalization duration of the patients applying with stroke was 38,8±67 days and this value was 36,3±49,7 days in the

patients with ischemic stroke whereas it was 42,8±87,7 days in the patients with hemorrhagic stroke. Incompatible with the literature, in our study, the hospitalization duration of the patients with hemorrhagic strokes was found longer. However, the comparison of the days was apparently higher. The obstacles that the patients involved in our study came across while trying to reach the health center, the development of some additional complications, the fact that supplying medical support to the patients under custody could be much easier are regarded as effective factors on the duration of hospitalization.

Conclusion

In our study, in terms of stroke development, hypertension was considered as a changeable risk factor; age and gender were considered as unchangeable risk factors and it was seen that they were all effective. Although much progress have been made in the treatment of stroke, we anticipate that the primary prevention is an effective approach and determining changeable risk factors in the stroke etiology through primary prevention and preventing them with follow-ups and treatment can minimize mortality and morbidity.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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